International Journal of Medical Research Professionals
P-ISSN: 2454-6356; E-ISSN: 2454-6364
DOI: 10.21276/ijmrp

Original Research Article.

Analysis of Ultrasonographic Findings in Liver Cirrhosis Patients in a Known Population: An Institutional Based Study

Vikash Kumar Gupta

Assistant Professor, Department of Radiodiagnosis,
Venkateshwara Institute of Medical Sciences, Gajraula, Amroha, Uttar Pradesh, India.

ABSTRACT

Background: Cirrhosis of the liver is a chronic, diffuse, and progressive condition characterized by fibrosis and the conversion of normal liver architecture into structurally abnormal nodules. Ultrasound (US) has a major role in the diagnosis and management of chronic liver diseases by providing diagnostic and prognostic information as well as detecting complications. Hence, the present study was conducted with the aim of assessing the ultrasonographic findings in liver cirrhosis patients in a known population.

Materials & Methods: A total of 40 patients with presence of liver cirrhosis were enrolled. Complete demographic details of all the patients were obtained. All the patients were scanned with Ultrasound scanners with a variable frequency probes. Liver parenchymal changes outline and nodularity of liver surface and any other abnormal abdominal findings were documented.

Results: In liver cirrhosis patients, nodularity of the surface with rounding of edges was seen in 90 percent of the patients. Hypoechoic nodules were seen in 87.5 percent of the patients. Splenomegaly and Ascites were seen in 77.5 percent and 72.5 percent of the patients respectively. The coarseness of the liver parenchyma and Irregularity and narrowness of the inferior vena cava were seen in 82.5 percent and 90 percent of the patients respectively.

Conclusion: Under the light of above obtained data, it can be concluded that USG is a non-invasive technique and is helpful in liver cirrhosis patients.

Key words: Liver, Cirrhosis, Ultrasonography.

***Correspondence to:**

Dr. Vikash Kumar Gupta,
Assistant Professor,
Department of Radiodiagnosis,
Venkateshwara Institute of Medical Sciences,
Gajraula, Amroha, Uttar Pradesh, India.

Article History:

Received: 11-08-2017, **Revised:** 06-09-2017, **Accepted:** 26-09-2017

Access this article online	
Website: www.ijmrp.com	Quick Response code
DOI: 10.21276/ijmrp.2017.3.5.089	

INTRODUCTION

Cirrhosis of the liver is a chronic, diffuse, and progressive condition characterized by fibrosis and the conversion of normal liver architecture into structurally abnormal nodules. The progression of liver injury to cirrhosis may occur over weeks to years. Cirrhosis poses a difficult challenge for management, while the disease's prevention, detection, and therapy engender major health costs. In patients with chronic liver disease, the stage of fibrosis is an important factor as it helps decide the therapeutic options and predict the prognosis.[1-3]

Ultrasound (US) has a major role in the diagnosis and management of chronic liver diseases by providing diagnostic and prognostic information as well as detecting complications such as HCC and portal hypertension. While conventional ultrasound is valuable in the assessment of liver parenchyma and detection of liver lesions, a range of other US techniques has been developed that increases its potential value. Non-invasive methods of measurements in chronic liver disease are rapidly changing in performance capabilities and availability. These include laboratory tests and imaging studies. An area of intense recent interest has been elastography because of its ability to provide non-invasive information about the stage of liver fibrosis.[4-6] Hence; the present study was conducted with the aim of assessing the USG findings in liver cirrhosis patients in a known population.

MATERIALS & METHODS

The present study was conducted with the aim of assessing the USG findings in liver cirrhosis patients in a known population. A total of 40 patients with presence of liver cirrhosis were enrolled. Complete demographic details of all the patients were obtained. All the patients were scanned with Ultrasound scanners with a variable frequency probes. After the patient fasted overnight, the examination was performed with the patient in the supine, right or left side position to obtain an optimal view of the abdominal viscera. Measurement of the liver and spleen was performed. Liver parenchymal changes outline and nodularity of liver surface and any other abnormal abdominal findings were documented. All

the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi-square test was used for evaluation of level of significance.

RESULTS

In the present study, a total of 40 patients with confirmed diagnosis of cirrhosis of liver were enrolled. Majority of the patients belonged to the age group of 51 to 60 years. Out of 40, 35 were males while the remaining 5 were females. Alcohol was the cause of liver cirrhosis in 60 percent of the patients. In liver cirrhosis patients, nodularity of the surface with rounding of edges was seen in 90 percent of the patients.

Hypoechoic nodules were seen in 87.5 percent of the patients. Splenomegaly and Ascites were seen in 77.5 percent and 72.5 percent of the patients respectively. The coarseness of the liver parenchyma and Irregularity and narrowness of the inferior vena cava were seen in 82.5 percent and 90 percent of the patients respectively.

Table 1: Age-wise distribution of patients

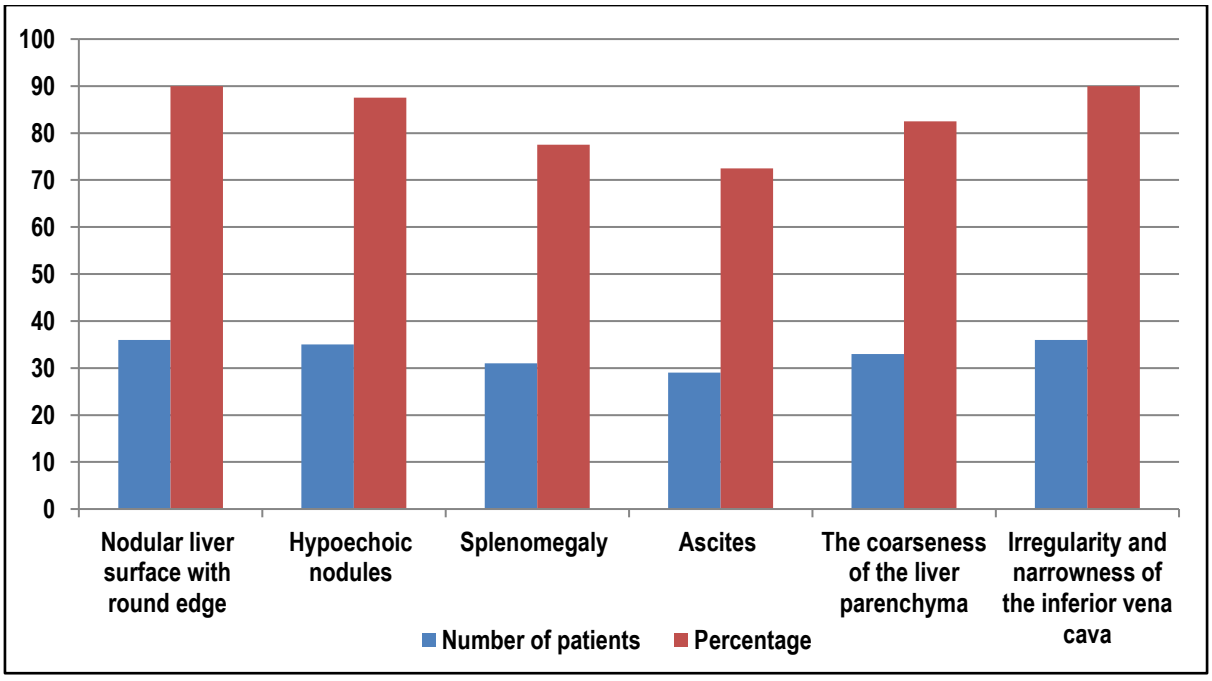
Age group (years)	Number of patients	Percentage
Less than 30	3	7.5
30 to 40	7	17.5
41 to 50	14	35
51 to 60	16	40
Total	40	100

Table 2: Gender-wise distribution of patients

Gender	Number of patients	Percentage
Males	35	87.5
Females	5	12.5
Total	40	100

Table 3: USG findings

USG findings	Number of patients	Percentage
Nodular liver surface with round edge	36	90
Hypoechoic nodules	35	87.5
Splenomegaly	31	77.5
Ascites	29	72.5
The coarseness of the liver parenchyma	33	82.5
Irregularity and narrowness of the inferior vena cava	36	90



Graph 1: USG findings

DISCUSSION

Cirrhosis refers to fibrosis or scarring of the liver with associated functional impairment. It has multiple etiologies, the most common of which include alcohol, viral hepatitis, non-alcoholic steatohepatitis, and chronic cholestatic diseases. The typical progression of disease involves increasing severity of bridging fibrosis with formation of regenerative nodules, the end result being cirrhosis with its many clinical and imaging manifestations. Ultrasound (US) is a non-invasive, inexpensive, and repeatable technique for diagnosis of focal and diffuse parenchymal disease of the liver. It is used in combination with serum alpha fetoprotein as the most important and valuable diagnostic tool for detecting hepatocellular carcinoma (HCC) during the follow up of patients with viral hepatitis and other selected cirrhotics.[7- 10]

Hence; the present study was conducted with the aim of assessing the USG findings in liver cirrhosis patients in a known population.

In the present study, a total of 40 patients with confirmed diagnosis of cirrhosis of liver were enrolled. Majority of the patients belonged to the age group of 51 to 60 years. Out of 40, 35 were males while the remaining 5 were females. Alcohol was the cause of liver cirrhosis in 60 percent of the patients. In liver cirrhosis patients, nodularity of the surface with rounding of edges was seen in 90 percent of the patients. A recent retrospective study on the accuracy of conventional US in the staging of fibrosis found that routine US is not an accurate predictor for either early or significant fibrosis in chronic viral hepatitis. However, in a series of 103 patients with chronic liver disease it has been shown that liver parenchymal texture (graded as fine echotexture, mildly coarse, coarse and highly coarse) has a statistically significant correlation ($r_s = 0.8853$) with the degree of fibrosis. When combined with two more features (liver surface nodularity and liver edge), correlation with the degree of fibrosis increased to $r_s = 0.9524$. When compared to echotexture, liver surface nodularity has better accuracy for the presence of cirrhosis.[7- 11]

In the present study, hypoechoic nodules were seen in 87.5 percent of the patients. Splenomegaly and Ascites were seen in 77.5 percent and 72.5 percent of the patients respectively. The coarseness of the liver parenchyma and Irregularity and narrowness of the inferior vena cava were seen in 82.5 percent and 90 percent of the patients respectively. Bennett GL et al determined the sensitivity and specificity of sonography as an aid in detecting hepatocellular carcinomas and dysplastic nodules using explantation correlation in patients with cirrhosis and no known hepatocellular carcinomas. The sonography reports of 200 patients with cirrhosis who underwent sonography and then underwent liver transplantation within 90 days were retrospectively reviewed for focal solid liver lesions. Twenty-seven patients (13.5%) had hepatocellular carcinoma at explantation, including four patients with diffuse, multifocal tumors. Eight of the 39 lesions were detected on sonography for a patient sensitivity of 29.6% and a lesion sensitivity of 20.5%. Sonography revealed three (75%) of four hepatocellular carcinomas larger than 5 cm in diameter, one (50%) of two hepatocellular carcinomas with diameters of 3.1-5.0 cm, one (20%) of five hepatocellular carcinomas with diameters of 2.1-3.0 cm, three (13.6%) of 22 hepatocellular carcinomas with diameters of 1-2 cm, and no lesions with diameters smaller than 1 cm. Forty-two patients (21%) had a total of 126 dysplastic nodules including two patients with innumerable lesions. Sonography depicted only two dysplastic nodules, for a patient sensitivity of 4.8% and a lesion sensitivity of 1.6%. The overall specificity of sonography for either hepatocellular carcinomas or dysplastic nodules was 96%. Sonography had low sensitivity but high specificity in revealing hepatocellular carcinomas and dysplastic nodules in patients with a cirrhotic liver requiring liver transplantation.[12]

Liver cirrhosis is characterized by changes in liver volume distribution, surface nodularity, accentuation of the fissure, heterogeneity, bright and coarsening of the hepatic architecture, cirrhotic nodules including regenerative and dysplastic nodules, and signs of portal hypertension. Studies showed an overall sensitivity to chronic liver disease of 65%-95%, with a positive predictive value of 98%. The most indicative finding of liver cirrhosis was nodular surface, which was more sensitive on the under surface of the liver than the superior surface (86% vs 53%). It was also more sensitive in a high frequency probe. Although any single US feature had limited sensitivity or specificity in detecting cirrhosis, improvements could be achieved by combining two or three parameters.[11,13,14]

CONCLUSION

Under the light of above obtained data, it can be concluded that USG is a non-invasive technique and is helpful in liver cirrhosis patients.

REFERENCES

1. Friedrich-Rust M, Ong MF, Herrmann E, et al. Real-time elastography for noninvasive assessment of liver fibrosis in chronic viral hepatitis. AJR Am J Roentgenol 2007;188: 758-64.

2. Lewin M, Poujol-Robert A, Boelle PY, et al. Diffusion-weighted magnetic resonance imaging for the assessment of fibrosis in chronic hepatitis C. Hepatology 2007;46:658-65.

3. Frey H. Realtime elastography. A new ultrasound procedure for the reconstruction of tissue elasticity [in German]. Radiologe 2003;43:850-5.

4. Srinivasan S, Kallel F, Ophir J. The effects of digitization on the elastographic signal-to-noise ratio. Ultrasound Med Biol 2002;28:1521-34.

5. Srinivasan S, Kallel F, Souchon R, et al. Analysis of an adaptive strain estimation technique in elastography. Ultrason Imaging 2002;24:109-18.

6. Maurice RL, Bertrand M. Lagrangian speckle model and tissue-motion estimation theory. IEEE Trans Med Imaging 1999;18:593-603.

7. Choong CC, Venkatesh SK, Siew EP. Accuracy of routine clinical ultrasound for staging of liver fibrosis. J Clin Imaging Sci. 2012;2:58.

8. Nishiura T, Watanabe H, Ito M, et al. Ultrasound evaluation of the fibrosis stage in chronic liver disease by the simultaneous use of low and high frequency probes. Br J Radiol. 2005;78(927):189–97.

9. Di Lelio A, Cestari C, Lomazzi A, Beretta L. Cirrhosis: diagnosis with sonographic study of the liver surface. Radiology. 1989;172(2):389–92.

10. Filly RA, Reddy SG, Nalbandian AB, Lu Y, Callen PW. Sonographic evaluation of liver nodularity: Inspection of deep versus superficial surfaces of the liver. J Clin Ultrasound. 2002;30(7):399–407.

11. Colli A, Fraquelli M, Andreoletti M, Marino B, Zuccoli E, Conte D. Severe liver fibrosis or cirrhosis: accuracy of US for detection–analysis of 300 cases. Radiology. 2003;227(1):89–94.
12. Bennett GL, Krinsky GA et al. Sonographic Detection of Hepatocellular Carcinoma and Dysplastic Nodules in Cirrhosis: Correlation of Pretransplantation Sonography and Liver Explant Pathology in 200 Patients. American Journal of Roentgenology. 2002;179: 75-80.
13. Viganò M, Visentin S, Aghemo A, Rumi MG, Ronchi G. US features of liver surface nodularity as a predictor of severe fibrosis in chronic hepatitis C. Radiology. 2005;234:641.
14. Soresi M, Giannitrapani L, Cervello M, Licata A, Montalto G. Non-invasive tools for the diagnosis of liver cirrhosis. World J Gastroenterol. 2014;20:18131–50.

Source of Support: Nil. **Conflict of Interest:** None Declared.

Cite this article as: Vikash Kumar Gupta. Analysis of Ultrasonographic Findings in Liver Cirrhosis Patients in a Known Population: An Institutional Based Study. Int J Med Res Prof. 2017 Sept; 3(5): 443-46. DOI:10.21276/ijmrp.2017.3.5.089